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UNIVERSITY OF ILLINOIS,

Agricultural Experiment Station.

CHAMPAIGN, JUNE 9, 1894.

BULLETIN NO. 33.

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THE CHINCH BUG IN SOUTHERN ILLINOIS—1894.

In bulletin No. 19 of this Experiment Station, published in February, 1892, notice was given of the commencement of an extensive outbreak of the chinch bug in southern Illinois, with warning of its probable development in the following year. Acccording to our advices at that time, eight counties in the southern and south-central part of the state were injuriously infested, and eighteen other counties in the same region were mentioned in which the chinch bug was reported as of general occurrence in unusual numbers.

This attack increased in intensity during 1893, and this spring (1894) the chinch bugs emerged from their winter quarters in numbers sufficient to do great mischief in no less than twenty-four counties throughout the region above mentioned. The area seriously infested is practically the same as that to which attention was called in 1892, the counties now involved being Williamson, Jefferson, Perry, Washington, Clinton, Madison, Bond, Marion, Fayette, Clay, Richland, Jasper, Effingham, Cumberland, Montgomery, Macoupin, Scott, Morgan, Sangamon, Christian, Pike, Brown, Cass, and Henderson.

Economic measures now available are practically limited to experiments for the destruction of the chinch bugs in place by the introduction

of their contagious diseases, and to the interposition of barriers between small grain and corn to prevent their passage from one to the other as infested fields of small grain ripen or are destroyed. To accumulate and kill them as they pass from field to field, a deep furrow may be plowed,—to be kept clean and as friable as possible, especially on the vertical side, next the field to be protected,—and in this the accumulating bugs may be killed by a mixture of kerosene and water (about one part to eight), thoroughly and repeatedly shaken together. A variation of this method, used very successfully in Wisconsin, is to lay a quantity of green wheat or oats or fresh corn stalks in the furrow, in which the chinch bugs can be killed with this kerosene mixture as they accumulate.

An added measure of success with the barrier method may be secured if two parallel furrows are made instead of one, and the soil between them be kept dusty. The chinch bugs escaping the kerosene mixture, or other destructive agent, in the outer furrow could then be killed in the second. If they succeed in passing these barriers and collect upon the outer rows of corn, they may there be killed with kerosene, which should then be applied in the form of an emulsion to prevent injury to the young corn itself. To prepare this fluid, mix two parts of kerosene with one part of strong hot soap-suds, and violently agitate the mixture with a hand force-pump until a permanent cream or butter is formed. This may then be diluted with ten or twelve parts of water, and applied either with a sprinkler, or in a spray from a hand force-pump.

A more expensive and less readily manageable method is the planting of strips of some favorite food plant, as spring wheat, or other quick growing succulent cereal or grass, around infested wheat or around corn to be protected, where the chinch bugs may accumulate and be destroyed before laying their eggs for the second generation of the year. The bugs may be confined to the strip, after having entered it, by furrows plowed all around it and attended to from day to day until the destruction is complete.

For the benefit of those who wish to experiment with the introduction of contagious diseases, arrangements have been made to infect and distribute live chinch bugs to farmers, the funds for this experiment having been furnished by the Board of Direction of the State Agricultural Experiment Station. Those wishing such material should send to the undersigned, with the least possible delay, a collection of some thousands of live insects, enclosed with a little green vegetation (wheat, oats, or corn) and no dirt, in a tin box large enough to hold from a pint to a quart. Upon receipt of these they will be exposed to infection by confining them in a tight box with a large quantity of dead and dying chinch bugs, and returned without charge to the senders, with full directions for use.

The results of this method are, however, not sufficiently certain to

warrant an entire dependence upon it; and it should be made one feature only of a general and concerted campaign. I cannot too strongly insist upon the fact, emphasized by eleven years' experience with the chinch bug, that it is not to be mastered by any one measure or any one man, but that joint action on an intelligent programme of preventive and protective measures persistently followed up, offers the only valid hope of success.

S. A. FORBES, PH. D., *State Entomologist.*

ALKALINE TABLETS FOR TESTING THE ACIDITY OF CREAM.

Since the first description of these tablets was published in bulletin No. 32, Professor Morrow, of this station, has made a valuable suggestion which has been adopted in the use of the tablets for testing the sourness of the cream. He suggested that substitution of one graduated bottle for the three or four separate bottles in which the tablets are dissolved in water. This is found to be an improvement, as it not only decreases the necessary manipulations, but enables the operator to measure a smaller amount of acidity in cream than is represented by one tablet. A 50 c. c. glass cylinder, graduated, and on a foot, is found to be a convenient piece of apparatus to use in preparing the solution of the tablets. It is made of stout glass, not easily broken, and can be obtained of any dealer in chemical apparatus. Put five tablets into this cylinder, add hot or cold soft water, until the cylinder is filled up to the 50 mark, then cork the cylinder and shake frequently until the tablets all disappear in solution. When the tablets are all dissolved, the reddish colored liquid can be poured into the 25 c. c. of cream which is to be tested, until the cream is no longer white, but retains a pinkish color. This is the end of the test. The amount of the tablet solution which was used to produce this color in the cream, is thus measured by noting the number of tablets which were dissolved in the 50 c. c. of water and the number of c. c. of this solution it was necessary to use to neutralize the acid of the cream.

COMPOSITION OF THE TABLETS.

The tablets are made of sodium carbonate and phenolphthalein. The writer proposed the idea of mixing these two substances in the form of a tablet to a manufacturing chemist and requested him to make a trial of it. It was found by repeated trials and experiments of the manufacturer and the writer, that tablets could be made so that each one would contain a very exact amount of sodium carbonate, and there could

be mixed with it a sufficient quantity of phenolphthalein to give a pink color to 25 c. c. of milk or cream, when the latter was made alkaline by the sodium carbonate.

The mixing of these substances and molding into tablets, requires the skill and machinery of a manufacturing chemist.

Their usefulness depends in a large measure on the exactness with which they are made. E. H. FARRINGTON, M. S., *Chemist.*

CERTIFIED TESTS OF DAIRY COWS.

The Illinois Agricultural Experiment Station will supervise tests of dairy herds and, in exceptional cases, of individual cows owned or exhibited in Illinois under the following conditions:

The number of tests so supervised, and the times at which they shall be made, will be determined by the practicability of sending an authorized representative for the purpose without serious interference with other work of the station, but it is expected that there can be prompt compliance with all requests.

Preference will be given to tests of pure bred herds or cows kept for the rearing of dairy stock, and to tests continuing seven days.

The Station, through its representative, shall receive full information as to breeding, age, time of calving, date when bred, and treatment of the cows prior to the tests; also have full opportunity to determine the quantity and kinds of food used, and the methods of feeding and treatment during the tests, with privilege of taking samples of the food for inspection or analysis, as well as the quantity and quality of the milk or butter product.

The results of the tests, duly certified by the Station, will be furnished as soon as determined to the owners of the cows, or to the associations under whose auspices the tests are made. The Station shall have the right to make publication of the results obtained, but no publication will be made without consent of owners or associations until after the completion of any public competition in which the cows have been entered.

The expenses of the representative of the Station in going to and returning from the tests as well as his maintenance during the tests shall be paid by the owners of the cows or the associations authorizing the tests.

Blanks giving the details of observations to be made in the tests will be sent on application to AGRICULTURAL EXPERIMENTAL STATION, Champaign, Ill. G. E. MORROW, A. M.,

President Board of Direction.

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